



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of: Takashi KANO et. al.

Group Art Unit: 2812

Serial No.: 09/941,982

Examiner: Mulpuri, Savitri

Filed: August 30, 2001

Confirmation No.: 7336

For: METHOD OF FORMING NITRIDE-BASED SEMICONDUCTOR LAYER  
AND METHOD OF MANUFACTURING NITRIDE-BASED  
SEMICONDUCTOR DEVICE

Attorney Docket No.: 011083

Customer Number: 38834

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**INFORMATION DISCLOSURE STATEMENT PURSUANT TO 37 C.F.R. §1.97(c)**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
Sir:

January 16, 2004

The attention of the U.S. Patent and Trademark Office is hereby directed to the documents listed on the attached Form PTO-1449. One copy of each of these documents is attached along with a Notification of Reasons for Refusal (Office Action dated November 18, 2003) and an English translation thereof.

This Information Disclosure Statement is being submitted after the issuance of a first official action on the merits and expiration of the three month period following the filing date or the entry in the national stage for the above-captioned application, but prior to the issuance of either a Final Office Action, Notice of Allowance, or an action that otherwise closes prosecution in the application.

The undersigned hereby certifies: that each item of information contained in this statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement.

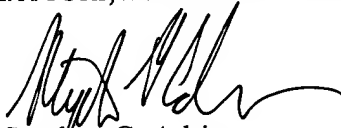
U. S. Patent Serial No.: 09/941,982

The above information is presented so that the Patent and Trademark Office may, in the first instance, determine any materiality thereof to the claimed invention. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the references cited in the attached Form 1449 is made of record therein and appear on the first page of any patent to issue therefrom.

The Commission is authorized to charge Deposit Account No. 50-2866 for any fee which is deemed by the Patent and Trademark Office to be required to effect consideration of this statement.

Respectfully Submitted,

**WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP**



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Enclosures: PTO-1449; 2 Refs and Office Action (Japanese and English Translation)

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<b>INFORMATION DISCLOSURE CITATION PTO-1449</b>	Atty. Docket No. <b>011083</b>	Serial No. <b>09/941,982</b>
	Applicant(s): <b>KANO, Takashi, et al.</b>	
	Filing Date: <b>August 30, 2001</b>	Group Art Unit: <b>2812</b>

### U.S. PATENT DOCUMENTS

Examiner Initial	Document No.	Name	Date	Class	Subclass	Filing Date (If appropriate)
_____	AA					
_____	AB					
_____	AC					
_____	AD					

### FOREIGN PATENT DOCUMENTS

Document No.	Date	Country	Translation (Yes or No)
_____	AE		
_____	AF		
_____	AG		
_____	AH		
_____	AI		
_____	AJ		

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### OTHER DOCUMENTS

_____	AK	Stacia KELLER, Effect of the Trimethylgallium Flow during Nucleation Layer Growth on the Properties of GaN Grown on Sapphire, Jpn. J. Appl. Phys., March 1, 1996, Vol. 35, No. 3A, pp. L285-L288.
_____	AL	Ki Soo KIM, Effects of Growth Rate of a GaN Buffer Layer on the Properties of GaN on a Sapphire Substrate, J. Appl. Phys., June 15, 1999, Vol. 85, No. 12, pp. 8441-8444.
Examiner		Date Considered

Reference Number NBA1001022

Dispatch Number 401963

Dispatch Date Nov/18/2003

Notification of Reason(s) for Refusal

Patent Application No. Patent application No.2000-265391

Drafting Date Nov/11/2003

Examiner of JPO Yoshimasa Waseda 2929 4R00

Representative/Applicant Yoshito Fukushima (and another)

Applied Provisions Patent Law Section 29(1),

Patent Law Section 29(2)

This application should be refused for the reasons mentioned below. If the applicant has any argument against the reason, such argument should be submitted within 60 days from the date on which this notification was dispatched.

Reason(s)

1) The invention(s) in the claim(s) listed below of the subject application should not be granted a patent under the provision of the Patent Law Section 29(1) No.3 since it is the invention(s) described in the publication(s) listed below which was distributed in Japan or foreign countries of the invention(s) made available for public use through

electric communication lines prior to the filing of the subject application.

2) The invention(s) in the claim(s) listed below of the subject application should not be granted a patent under the provision of the Patent Law Section 29(2) since it could have easily been made by persons who have common knowledge in the technical field to which the invention(s) pertains, on the basis of the invention(s) described in the publication(s) listed below which was distributed in Japan or foreign countries of the invention(s) made available for public use through electric communication lines prior to the filing of the subject application.

Note(The list of cited references etc. is shown below.)

As to Reason(s) 1) 2)

- Claims 1 to 3, 5 to 8, 10 to 12
- Cited References 1
- Remarks

Refer especially to the column "2. Experimental". In the invention described in the cited reference 1, the buffer layer is grown at a growth rate of from 0.67 Å/sec to 19 Å/sec.

As to Reason(s) 2)

- Claims 4, 9
- Cited References 1
- Remarks

No particular difficulties are found in setting of the growth rate of buffer layer in "the range from 25 Å/sec to 29 Å/sec". Further, the relationship between the growth rate of buffer layer and crystallinity varies depending on the substrate, composition and growth rate of the buffer layer, composition of the nitride-based semiconductor layer, etc. Thus, no effect can be found in mere setting of the growth rate of the buffer layer in "the range from 25 Å/sec to 29 Å/sec".

#### List of Cited References

1. Stacia KELLER, Effect of the Trimethylgallium Flow during Nucleation Layer Growth on the Properties of GaN Grown on Sapphire, Jpn. J. Appl. Phys., March 1, 1996, Vol. 35, No. 3A, pp. L285-L288

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#### Records of Search on Prior Art

- Field of Search

IPC Seventh Edition H01L 21/205, 33/00

H01S 5/343

• Prior Art

Ki Soo Kim, Effects of grown rate of a GaN buffer layer on the properties of GaN on a sapphire substrate, J. Appl. Phys., June 15, 1999, Vol. 85, No. 12, pp. 8441-8444

The records of Search on prior art are not part of the reasons for rejection.

## 拒絶理由通知書

特許出願の番号	特願 2 0 0 0 - 2 6 5 3 9 1
起案日	平成 1 5 年 1 1 月 1 1 日
特許庁審査官	和瀬田 芳正 2 9 2 9 4 R 0 0
特許出願人代理人	福島 祥人 (外 1 名) 様
適用条文	第 2 9 条第 1 項、第 2 9 条第 2 項

この出願は、次の理由によって拒絶をすべきものである。これについて意見があれば、この通知書の発送の日から 6 0 日以内に意見書を提出して下さい。

## 理 由

1) この出願の下記の請求項に係る発明は、その出願前に日本国内又は外国において、頒布された下記 of 刊行物に記載された発明又は電気通信回線を通じて公衆に利用可能となった発明であるから、特許法第 2 9 条第 1 項第 3 号に該当し、特許を受けることができない。

2) この出願の下記の請求項に係る発明は、その出願前日本国内又は外国において頒布された下記 of 刊行物に記載された発明又は電気通信回線を通じて公衆に利用可能となった発明に基いて、その出願前にその発明の属する技術の分野における通常の知識を有する者が容易に発明をすることができたものであるから、特許法第 2 9 条第 2 項の規定により特許を受けることができない。

記 (引用文献等については引用文献等一覧参照)

理由 1) 2) について

- ・請求項 1 - 3, 5 - 8, 1 0 - 1 2
- ・引用文献等 1
- ・備考

特に「2. Experimental」の欄を参照。引用例 1 に記載の発明ではバッファ層を  $0.67 - 1.9 \text{ \AA} / \text{sec}$  の成長速度で成長させているものである。

理由 2) について

- ・請求項 4, 9
- ・引用文献等 1
- ・備考

バッファ層の成長速度を「 $2.5 \text{ \AA} / \text{sec}$  以上  $2.9 \text{ \AA} / \text{sec}$  以下」としたことに格別の困難性は認められない。また、バッファ層の成長速度と結晶性の関係



1. Stacia KELLER, Effect of the Trimethylgallium Flow during Nucleation Layer Growth on the Properties of GaN Grown on Sapphire, Jpn. J. Appl. Phys., 1996年 3月 1日, 35巻, 3A号, pp. L285-L288

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